List of Contents

NUMBER 1

G. Bonham-Carter	iii	Editorial
D. G. Yegorov, A. N. Korobeinikov and M. I. Dubrovskii	1	CHEMPET—Calculation for the chemical systematics of igneous rocks based on the CIPW norm
Fernando António Leal Pacheco	7	Finding the number of natural clusters in groundwater data sets using the concept of equivalence class
Edzer J. Pebesma and Cees G. Wesseling	17	GSTAT, a program for geostatistical modelling, prediction and simulation
Daniele L. Pinti and Eddy Van Drom	33	PALEOTEMP: a *Mathematica*® program for evaluating paleotemperatures from the concentration of atmosphere-derived noble gases in ground water
Terence M. Gordon	43	WEBINVEQ thermobarometry: an experiment in providing interactive scientific software on the world wide web
James P. Syvitski, Mark D. Morehead and Murray Nicholson	51	HYDROTREND: a climate-driven hydrologic-transport model for predicting discharge and sediment load to lakes or oceans
Clayton V. Deutsch	69	FORTRAN programs for calculating connectivity of three-dimensional numerical models and for ranking multiple realizations
D. L. Biddle, D. J. Chittleborough and R. W. Fitzpatrick	77	An algorithm to model mass balances quantitatively
Yet-Chung Chang, Gwo-Shyh Song and Shu-Kun Hsu	83	Automatic extraction of ridge and valley axes using the profile recognition and polygon-breaking algorithm
Short Note		
Guido Gonzato	95	A practical implementation of the box counting algorithm
Letter to the Editor		
Peter L. Guth	101	Comment on "The influence of timescales in basin modeling calculations", by R. O. Thomsen and I. Lerche, *Computers & Geosciences,* **23**(1), 33–44
Response		
I. Lerche	105	On log-normal distributions, timescales and basin analysis calculations
Anon		
B. Van Der Hoek and J. C. Butler	109	Electronic publishing on the Web—A publisher's view

NUMBER 2

A. T. Williams, R. J. Wiltshire and M. C. Thomas	111	Sand grain analysis—image processing, textural algorithms and neural nets

Dongming Hwang, Hassan A. Karimi and Daewon W. Byun — 119 Uncertainty analysis of environmental models within GIS environments

Hanqiu Xu and I. A. J. MacCarthy — 131 Markov chain analysis of vertical facies sequences using a computer software package (SAVFS): Courtmacsherry Formation (Tournaisian), Southern Ireland

J. Mark Ware — 141 A procedure for automatically correcting invalid flat triangles occurring in triangulated contour data

M. A. Wulder — 151 The prediction of leaf area index from forest polygons decomposed through the integration of remote sensing, GIS, UNIX, and C

James P. Syvitski, Kenneth I. Skene, Murray K. Nicholson and Mark D. Morehead — 159 PLUME1.1: Deposition of sediment from a fluvial plume

Ting-To Yu, Josè Fernàndez and John B. Rundle — 173 Inverting the parameters of an earthquake-ruptured fault with a genetic algorithm

Darcy K. Molnár and Pierre Y. Julien — 183 Estimation of upland erosion using GIS

Short Notes

Chong-Wei Huang and Tian-Yuan Shih — 193 Improvements on Sloan's algorithm for constructing Delaunay triangulations

Tom Andersen — 197 PBI—An EXCEL workbook for interactive graphical modelling of lead isotope data on minerals and rocks

ANON

D. Trippel and John C. Butler — 201 Bridging the communications gaps between the user and the information technology support staff

Book Reviews

Frederik P. Agterberg — 203 *How Nature Works: The Science of Self-Organized Criticality, by Per Bak*

Geoff Bohling — 207 *Applied Contaminant Transport Modeling: Theory and Practice, by Chunmiao Zheng, Gordon D. Bennett*

I Announcement

NUMBER 3

James R. Carr — 209 A Visual Basic program for principal components transformation of digital images

Edgar Dachs — 219 PET: petrological elementary tools for Mathematica

Douglas D. Nelson and William E. Full — 237 An improved program for the calculation of high-resolution Fourier coefficients used for shape analysis

Carl M. Knox-Robinson and Stephen J. Gardoll — 243 — GIS-stereoplot: an interactive stereonet plotting module for ArcView 3.0 geographic information system

Serhat Akin and Birol Demiral — 251 — Genetic algorithm for estimating multiphase flow functions from unsteady-state displacement experiments

Antonio Schettino — 259 — Computer-aided paleogeographic reconstructions

Eric A. de Kemp — 269 — Three-dimensional projection of curvilinear geological features through direction cosine interpolation of structural field observations

Short Note
Igor B. Morozov — 285 — 3D seismic processing monitor

ANON
M. Rujek and J. C. Butler — 289 — Evolution of the cooperative university-based program in Earth system science education

Book Reviews
John C. Tipper — 291 — *Mathematical Models in the Applied Sciences, by A. C. Fowler*

Geoff Bohling — 293 — *Introduction to Geostatistics: Applications in Hydrogeology, by P.K. Kitanidis*

Review
Geoff Bohling — 295 — Computational Geosciences

NUMBER 4

Editorial
Dave Unwin — 297 — Computers, Geoscience and Geocomputation

James Brasington and Keith Richards — 299 — Interactions between model predictions, parameters and DTM scales for TOPMODEL

Kevin H. Jones — 315 — A comparison of algorithms used to compute hill slope as a property of the DEM

Nicholas J. Tate — 325 — Estimating the fractal dimension of synthetic topographic surfaces

Frans J. M. van der Wel, Linda C. van der Gaag and Ben G. H. Gorte — 335 — Visual exploration of uncertainty in remote-sensing classification

S. C. Dibben, I. F. Jefferson and I. J. Smalley — 345 — The "Loughborough Loess" Monte Carlo model of soil structure

David Favis-Mortlock — 353 — A self-organizing dynamic systems approach to the simulation of rill initiation and development on hillslopes

P. M. Atkinson and R. Massari — 373 — Generalised linear modelling of susceptibility to landsliding in the Central Apennines, Italy

Hester Jiskoot, Paul Boyle and Tavi Murray — 387 — The incidence of glacier surging in Svalbard: evidence from multivariate statistics

ANON
M. Lamberson and John C. Butler 401 I don't have time for this!

Book Review
J. J. Butler, Jr. 403 A Practical Guide to Groundwater and Solute Transport Modeling, by K. Spitz and J. Moreno

NUMBER 5

Robert V. Demicco 405 CYCOPATH 2D: a two-dimensional, forward model of cyclic sedimentation on carbonate platforms

A. Dogan Paktunc 425 MODAN: an interactive computer program for estimating mineral quantities based on bulk composition

Martin H. Trauth 433 TURBO: a dynamic-probabilistic simulation to study the effects of bioturbation on paleoceanographic time series

Jeffrey R. Key and Axel J. Schweiger 443 Tools for atmospheric radiative transfer: *Streamer and FluxNet*

Eulogio Pardo-Igúzquiza 453 Inference of spatial indicator covariance parameters by maximum likelihood using MLREML

A. Garcia, I. Hernandez, G. Espinosa and E. Santoyo 465 TEMLOPI: a thermal simulator for estimation of drilling mud and formation temperatures during drilling of geothermal wells

J. Andrew Royle and Doug Nychka 479 An algorithm for the construction of spatial coverage designs with implementation in SPLUS

Irmund Thum 489 A flow chart for the classification of igneous rocks in HTML — Is a web browser another way for teaching earth sciences?

Short Notes
C. J. S. Fourie 495 Spreadsheet reductions of gravity data

J. Estalrich and J. Trilla 501 GATAGRASS: a graphical user interface for using with GRASS GIS

ANON
H. Dodson, J. Johnson, P. Levin, R. Souviney and J. C. Butler 507 Visualizing Earth Project

NUMBER 6

G. Gottardi 509 POLF: Two-dimensional finite-element model for predicting the areal flow of pollutant in confined and unconfined aquifers

Tien-Chang Lee 523 LEEGRAM: a program for normalized Stiff diagrams and quantification of grouping hydrochemical data

James R. Carr and Kenneth Mela 531 Visual Basic programs for one, two or three-dimensional geostatistical analysis

Eulogio Pardo-Igúzquiza 537 MLREML4: A program for the inference of the power variogram model by maximum likelihood and restricted maximum likelihood

R. J. Durrheim and G. R. J. Cooper 545 EULDEP: a program for the Euler deconvolution of magnetic and gravity data

Clayton V. Deutsch 551 Cleaning categorical variable (lithofacies) realizations with maximum a-posteriori selection

Steve Horne and Colin MacBeth 563 A comparison of global optimisation methods for near-offset VSP inversion

Katsuaki Koike, Shuichi Nagano and Kouji Kawaba 573 Construction and analysis of interpreted fracture planes through combination of satellite-image derived lineaments and digital elevation model data

Short Notes
C. Shorrock and R. J. Lisle 585 *DATACON: A quickbasic program to reformat orientation data from faults*

R. A. White and D. A. Miller 591 Processing soil survey information with Perl

ANON
R. Buchanan, T. Carr and J. C. Butler 595 The impact of electronic dissemination: What do users think?

Software Review
G. Bohling 597 EnvironenntalStats for S-Plus, version 1.0

I Announcement

NUMBER 7

G. Bonham-Carter 603 Note from the Editor-in-Chief

Editorial
John C. Butler 605 Teaching with multimedia

Daniel C. Edelson and Douglas Gordin 607 Visualization for learners: a framework for adapting scientists' tools

John C. Butler 617 The Internet—a catalyst for change

Dorothy L. Stout 623 The earth in technological balance

D. Cartwright 627 What's next on the Internet?

Scott Argast and Timothy Corey 633 Using the World Wide Web for interactive control of an X-ray diffractometer

S. Krumm and I. Thum 641 Distance learning on the Web supported by Javascript: a critical appraisal with examples from clay mineralogy and knowledge-based tests

C. E. Ford 649 Supporting fieldwork using the Internet

Stephen D. Hurst 653 Use of "virtual" field trips in teaching introductory geology

Brian Whalley and Stephen Trew	659	Internet provision for staff and students: an information-rich approach
Roger J. Suthren	665	Virtual posters and virtual essays in geoscience courses
John Castleford	673	Links, lecturing and learning some issues for geoscience education
George R. Douglas	679	Designing a web site for high school geoscience teaching in Iceland
Warren D. Huff	689	Using Internet resources in an introductory geology course
C. J. Mann	693	Teaching on the WEB
Donald L. Reed	699	Riding a tsunami in ocean science education
P. J. W. Gore	707	Distance learning: moving toward online geoscience classes in Georgia
Abigail Hubbard	713	What it means to teach online
Short Note G. M. Dipple, M. N. Lamberson and T. M. Gordon	719	Experiences delivering a multi-site course using interactive video and the Internet
ANON J. C. Butler	725	Distance education (II)
Book Review C. Rush	727	Environmental Studies: Mathematical, Computational, and Statistical Analysis, edited by M. Fanett

NUMBER 8

Emmanuel Gringarten	729	FRACNET: Stochastic simulation of fractures in layered systems
Dawn Wright, Ray Wood and Brendan Sylvander	737	ArcGMT: a suite of tools for conversion between Arc/INFO and Generic Mapping Tools (GMT)
J. Scott Goodchild and Frank Fueten	745	Edge detection in petrographic images using the rotating polarizer stage
Allan T. Emrén	753	CRACKER: a program coupling inhomogeneous chemistry and transport
Yakov Pachepsky and Dennis Timlin	765	Generating spatially correlated fields with a genetic algorithm
Moira A. Mugglestone and Eric Renshaw	771	Detection of geological lineations on aerial photographs using two-dimensional spectral analysis
Joseph Kolibal and John Monde	785	Fractal image error analysis
P. V. Sathe and P. M. Muraleedharan	797	Retrieval and processing of atmospheric parameters from satellite data

Roberto Cossio and Alessandro Borghi — 805 — PETROMAP: MS-DOS software package for quantitative processing of X-ray maps of zoned minerals

Short Notes
Wei Luo — 815 — Hypsometric analysis with a geographic information system

K. M. Sivakholundu and N. Prabaharan — 823 — A program to compute the area of an irregular polygon on a spheroidal surface

ANON
John C. Butler — 827 — Rethinking expectations

NUMBER 9

Neil S. Mancktelow — 829 — A stepwise discrete Fourier transform approach to 1D thermal modelling of exhumation by erosion and stretching

Susanne Börjesson and Allan Emrén — 839 — PASSIPHIC: A program for solubility calculations involving complex solids

P. O. Nwogbo — 847 — Spectral prediction of magnetic source depths from simple numerical models

Nita Sahai and Dimitri A. Sverjensky — 853 — GEOSURF: a computer program for modeling adsorption on mineral surfaces from aqueous solution

R. Marschallinger — 875 — A method for three-dimensional reconstruction of macroscopic features in geological materials

Short Notes
Fuat Yavuz — 885 — BIOAPAG-PC: program for an apatite and biotite geothermometer

Julii Brainard — 893 — Utilities to calculate Cohen's coefficient of agreement in two proprietary software systems

Michael W. Knappertsbusch — 897 — A simple Fortran 77 program for outline detection

Youngdo Park and Changwhan Oh — 901 — CONTACT2: A Macintosh program for calculating heat conduction in a contact aureole

ANON
Gary Novak and John C. Butler — 905 — The Web: What's missing?

Book Review
Graham C. Wilson — 907 — The GeoSEARCH database, including GeoArchive on CD-ROM, edited by Geosystems

NUMBER 10

Tingting Yao — 911 — **specsim**: A Fortran-77 program for conditional spectral simulation in 3D

Jeffrey D. Warren, Thomas S. Denney Jr. and Charles E. Savrda — 923 — MATLAB algorithm for grayscale analysis of carbonate cyclicity: example application to Demopolis chalk (Cretaceous, Alabama)

N. C. Fitton and S. J. D. Cox — 933 — Optimising the application of the Hough transform for automatic feature extraction from geoscientific images

G. A. Athanasopoulos, T. B. Panagiotakos and S. A. Maravegias — 953 — NOLISM: a pc program for the evaluation of parameters describing the non-linear dynamic behavior of soil materials

Thomas L. Moore — 965 — A software "tool kit" in C for the application of spherical geodesic grids in paleoclimatology

Tswn-Syau Tsay and John A. Hoopes — 979 — Numerical simulation of ground water mounding and its verification by Hele–Shaw model

N. Srinivasa Rao — 991 — MHPT.BAS: a computer program for modified Hill–Piper diagram for classification of ground water

Paramesh Banerjee — 1009 — Gravity measurements and terrain corrections using a digital terrain model in the NW Himalaya

Short Note
Surendra P. Verma, Rosalía Ciriaco-Villanueva and Ignacio S. Torres-Alvarado — 1021 — SIMOCF: modeling fractional crystallization using a Monte Carlo approach

ANON
R. J. Suthren and J. C. Butler — 1029 — Web-based learning: getting students involved

Book Review
D. Perugini — 1031 — Spatial Database Transfer Standards 2: Characteristics for Assessing Standards and Full Description of the National and International Standards in the World

I — The Contents List, Author Index and Keywords Index for Vol. 24, 1998